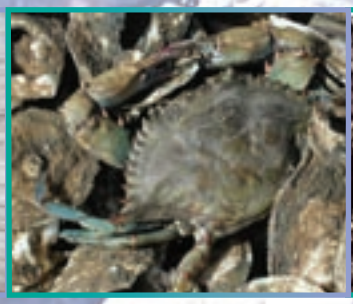
Virginia Oyster Gardening



This guide was written and produced by Laura McKay and Virginia Witmer of the Virginia Coastal Zone Management Program based largely on a document written in 1999 by Mark Luckenbach, Francis O'Beirn and Jake Taylor of the Virginia Institute of Marine Science: "An Introduction to Culturing Oysters in Virginia". Our thanks to Mark for letting us "recycle" that text and for helping to structure this new version. Thanks to Jackie Partin and Chan Chandler of the Tidewater Oyster Gardeners Association, Jim Wesson of the Virginia Marine Resources Commission, Laurie Carroll Sorabella of Oyster Reef Keepers and Lynnhaven 2007 and Chris Moore and Amy Blow of the Chesapeake Bay Foundation for their guidance and input on this document. Thanks also to Rachel Bullene of the Virginia CZM Program staff and to our summer intern, Lauren Harris, for their help in researching and compiling information.

Funds for the printing of this document came from the Department of Commerce, National Oceanic and Atmospheric Administration's Chesapeake Bay Office to the Virginia Oyster Reef Heritage Foundation. Our thanks to Rich Takacs at NOAA and Cliff Schroeder at VORHF for their support of this guide.

Virginia Coastal Zone
MANAGEMENT PROGRAM

NOAA

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Virginia Institute of Marine Science
School of Marine Science

Virginia Marine Resources Commission

Virginia Oyster Reef Heritage Foundation

TOGA
TIDEWATER OYSTER GARDENERS ASSOCIATION

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Welcome to Oyster Gardening!

Thank you for starting your own oyster garden!

We hope this oyster gardening guide will help you learn how to grow oysters in the most efficient way possible while gaining an understanding of the challenges that the once plentiful oyster now faces due to disease and predators.

The information is as up to date as possible, but as new information becomes available, please check the Web sites listed at the end of the guide for the most current information. This this guide is also available on the Web at www.deq.virginia.gov/coastal/ and this Web version will be updated as needed.

We hope that through oyster gardening you will become a proponent for restoration efforts to help increase oyster populations and improve Virginia's coastal waters. We also hope that you will encourage others to take up this hobby. Remember even if you don't own waterfront property, your friends, neighbors, employers, schools, local parks and businesses might - and you could be the one to get them hooked on oyster gardening.

Have Fun!

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Oyster Gardening Can Help Virginia's Coast!

Whether you are planning to grow oysters for your own consumption, for donation to sanctuary oyster reefs or for some other reason, your efforts can help in improving water quality and biodiversity along our coast.

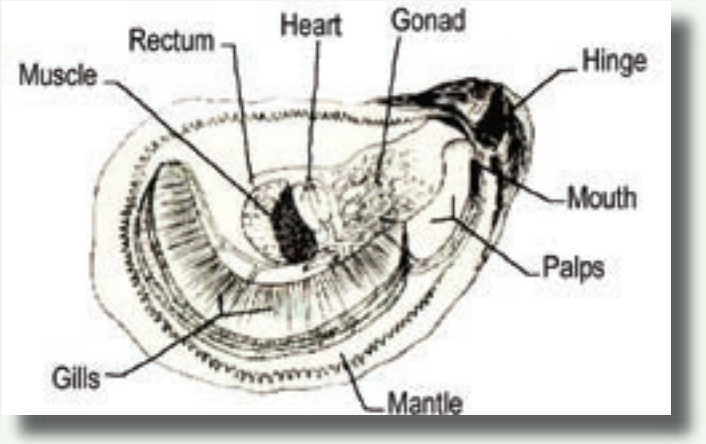
And that is no small gesture! As Virginia's population continues to increase (we are the 5th fastest growing state in the country), it becomes more and more difficult to deal with the increased amounts of sewage, fertilizer, car emissions, and other pollutants associated with our human activities.

Human sewage, waste from pets and livestock, fertilizers, and car emissions all contribute huge quantities of nitrogen to our coastal waters. Too much nitrogen causes algae blooms, turning the water a greenish hue and preventing sunlight from reaching precious underwater grass beds.

When this algae dies, decomposing organisms experience a population boom. Because the decomposers are oxygen breathing, their sudden increase in numbers pulls huge amounts of oxygen out of the water creating a condition called anoxia. Anoxia causes our valued finfish and shellfish to die. So the end result of excessive nitrogen in our coastal waters is dead finfish and shellfish and the loss of critical underwater habitats.

Here's how oyster gardening helps…

There are already over 2,000 oyster gardeners "cultivating" Virginia waters. But we need many, more! Growing oysters helps to improve water quality because each adult oyster filters up to 50 gallons of water per day when water temperatures are above 50 degrees. They are filtering particles out of the water, including algae and sediment. They do this by beating the cilia on their gills and drawing water in at a rate of 2-3 gallons per hour. The food particles, caught in mucous strings on their gills, are passed around the gills to the palps where the oyster sorts food from non-food. If the particle is food (algae), it ingests it. If the particle is non-food (e.g. sediment), the oyster excretes it as "psuedo-feces" which fall to the bottom. So the oyster is effectively pulling algae and fine sediment out of the water column, clarifying it.



Clear water is needed in order for underwater grass beds, rooted to the bottom, to grow. Underwater grass beds, or SAV (submerged aquatic vegetation) is essential habitat for other finfish and shellfish and also supports ducks and other animals. In addition to performing the Herculean task of cleaning the water and enabling the growth of seagrass habitats, natural oyster reefs provide habitat to a tremendous number and variety of other finfish and shellfish.

Photo courtesy of CBF.

Why are so few wild oysters left?

Based on historical accounts, three-dimensional oyster reefs were once a prominent feature of Virginia's coast. Captain John Smith reported in the early 1600's that you could practically walk across the James River on the tops of oyster reefs. During the Civil War, oyster reefs were so large that they were a danger to navigation in the Chesapeake Bay. And In the early 1900's Diamond Jim Brady was said to have eaten over 100 oysters in one sitting. At times in the past Virginia was producing 7-8 million bushels of oysters a year with approximately 20 million bushels harvested Bay-wide.

Recently the oyster harvest has been as small as 20,000 bushels. The dramatic crash of the oyster' population occurred because of harvesting, habitat destruction and two diseases. These diseases, commonly called MSX and Dermo, are caused by protozoan parasites and were first identified in the mid-Atlantic in the 1950's. Dermo is a disease that is native to Chesapeake Bay and usually kills oysters in their 2nd or 3rd year. MSX was introduced into the region in the 1950's when someone attempted to introduce a non-native oyster. Due to these diseases, continued heavy harvesting, and decreased water quality, we now have only about 2% of the oyster population that existed here as recently as the 1950's.

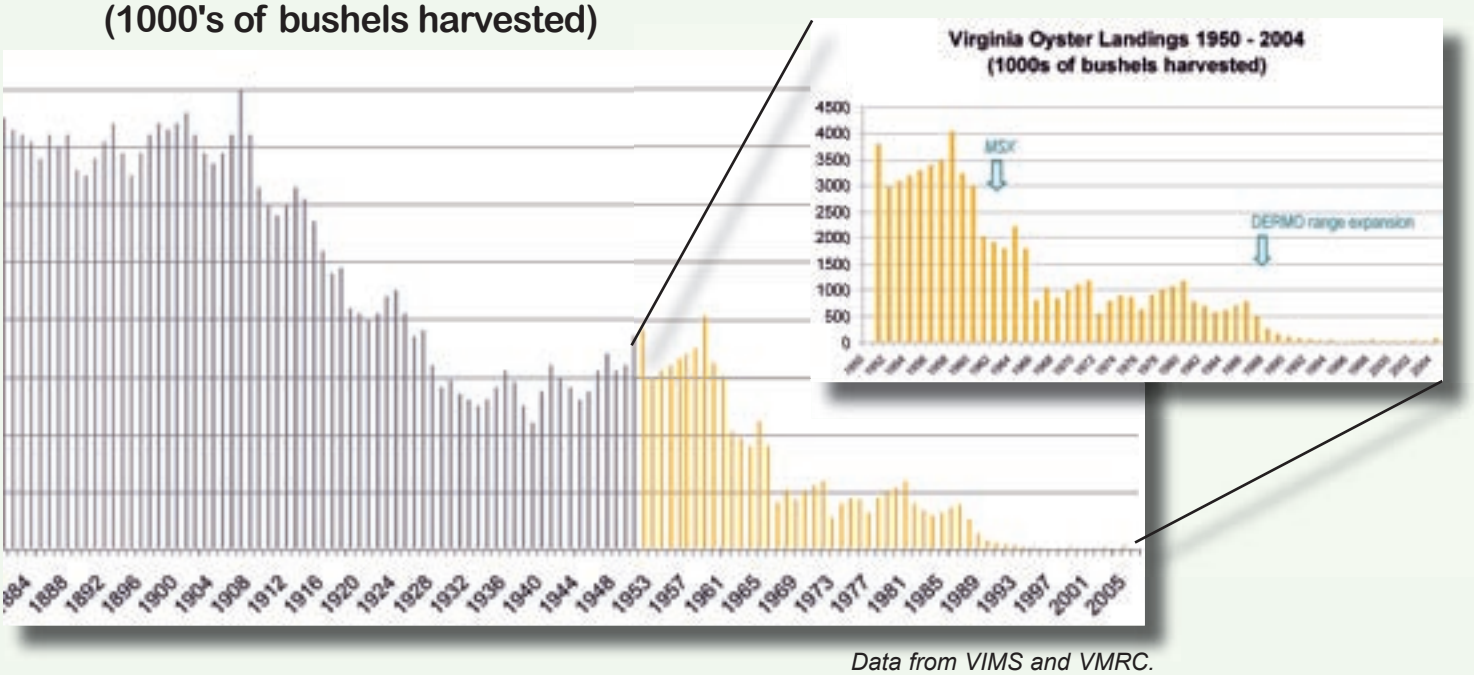
See Reference A on page 17 for more information on oyster diseases and breeding for resistance.

Culturing oysters can increase our native population.

Commercial oyster aquaculture and private oyster gardening are two promising ways in which we can increase our native oyster population. For many years resource managers and scientists have been trying various techniques to culture oysters for commercial purposes and to restore wild oysters in Virginia. This work has included development of disease tolerant strains of oysters, construction of small-scale and large scale reefs using a variety of settlement substrates, and even the testing of non-native species of oysters. In 1999 the Virginia Coastal Zone Management Program brought together VMRC, VIMS, NOAA, ACOE and others to form the Virginia Oyster Heritage Program to bring attention and funding to the issue of oyster restoration. Much work remains to be done and success with wild oyster restoration has been limited so far.

So as restoration of wild oysters and vast expanses of oyster reefs continues to elude us, we look to commercial cultivation and oyster gardening as one way of increasing our native oyster population. Virginia's seafood industry is struggling and our coastal waters are in dire need of cleaning. And while most of our efforts need to be focused on reducing the land-based sources of nitrogen such as human sewage, waste from pets and livestock, fertilizers, and car emissions, it would certainly help to have more oysters filtering all that algae that results from the excess nitrogen. The cumulative impact of thousands of people growing oysters could be quite significant!

Virginia Oyster Landings 1880-2004
(1000's of bushels harvested)



Data from VIMS and VMRC.